

Study Guide

For use with pages 287–292

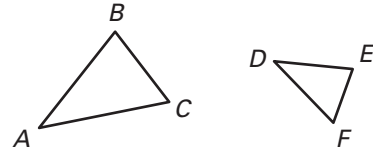
GOAL Identify similar and congruent figures.**VOCABULARY**

Two figures are **similar figures** if they have the same shape but not necessarily the same size. The symbol \sim indicates that two figures are similar. **Corresponding parts** of figures are sides or angles that have the same relative position.

Two figures are **congruent** if they have the same shape *and* the same size. If two figures are congruent, then the corresponding angles are congruent and the corresponding sides are congruent.

EXAMPLE 1 Identifying Corresponding Parts of Similar Figures

Given $\triangle ABC \sim \triangle DEF$, name the corresponding angles and the corresponding sides.

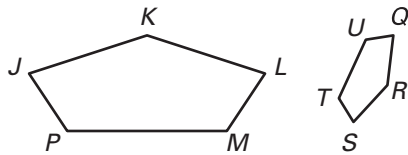
**Solution**

Corresponding angles: $\angle A$ and $\angle D$, $\angle B$ and $\angle E$, $\angle C$ and $\angle F$

Corresponding sides: \overline{AB} and \overline{DE} , \overline{BC} and \overline{EF} , \overline{AC} and \overline{DF}

Exercise for Example 1

1. Given $JKLM \sim QRSTU$, name the corresponding angles and the corresponding sides.

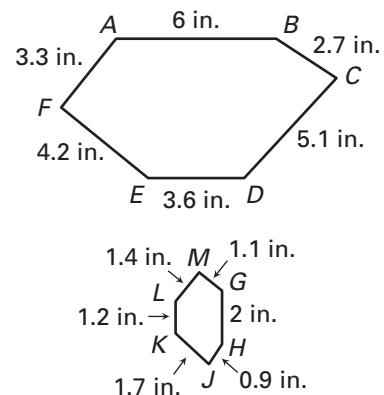
**EXAMPLE 2** Finding the Ratio of Corresponding Side Lengths

Given $ABCDEF \sim GHJKLM$, find the ratio of the lengths of the corresponding sides of $ABCDEF$ to $GHJKLM$.

Write a ratio comparing the lengths of a pair of corresponding sides. Then substitute the lengths of the sides and simplify.

$$\frac{AB}{GH} = \frac{6}{2} = \frac{3}{1}$$

Answer: The ratio of the lengths of the corresponding sides is $\frac{3}{1}$.



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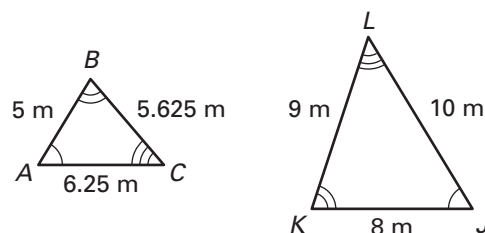
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EXAMPLE 3 Checking for Similarity

Tell whether the triangles are similar.

Solution

Because $\angle A \cong \angle J$, $\angle B \cong \angle K$, and $\angle C \cong \angle L$, corresponding angles are congruent. To decide if the triangles are similar, determine whether the ratios of the lengths of corresponding sides are equal.



$$\frac{AB}{JK} \stackrel{?}{=} \frac{BC}{KL} \stackrel{?}{=} \frac{AC}{JL} \quad \text{Write proportion.}$$

$$\frac{5}{9} \stackrel{?}{=} \frac{5.625}{10} \stackrel{?}{=} \frac{6.25}{8} \quad \text{Substitute values.}$$

$$0.625 = 0.625 = 0.625 \quad \text{Divide. The ratios are equal.}$$

Answer: The corresponding angles are congruent and the ratios of the lengths of the corresponding sides are equal, so $\triangle ABC \sim \triangle JKL$.

EXAMPLE 4 Finding Measures of Congruent Figures

Given $GHJK \cong PQRS$, find the indicated measure.

a. GH

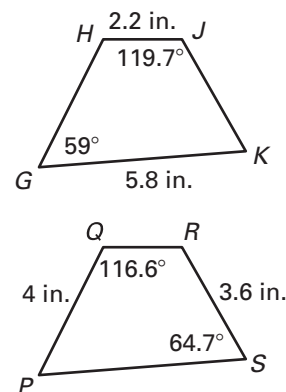
b. $m\angle K$

Solution

Because the quadrilaterals are congruent, the corresponding angles are congruent and the corresponding sides are congruent.

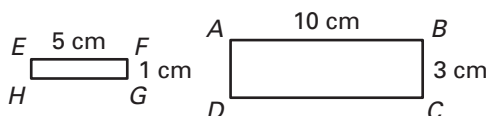
a. $\overline{GH} \cong \overline{PQ}$. So, $GH = PQ = 4$ inches.

b. $\angle K \cong \angle S$. So, $m\angle K = m\angle S = 64.7^\circ$.



Exercises for Examples 2–4

- Tell whether the rectangles are similar. If they are similar, find the ratio of the lengths of the corresponding sides of $EFGH$ to $ABCD$.



- Given $\triangle MNP \cong \triangle STU$, find TU and $m\angle N$.

